Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BARBARA A. HALL, AGNES Y. NGAI, CHARLES J. STEIN, EVERETT G. VAIL III, and EDWARD F. WESTERMANN

Appeal No. 2004-1138
Application No. 09/046,121

ON BRIEF

Before JERRY SMITH, GROSS, and BLANKENSHIP, ***Administrative Patent Judges***.

GROSS, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 5, 7, 9, 12, 13, 15 through 18, 20 through 26, 28, and 31 through 38. Claim 11 has been canceled, and claims 6, 8, 10, 14, 19, 27, 29, and 30 have been allowed.

Appellants' invention relates to a method and system for encoding a frame having plural macroblocks. The method uses intraframe statistics to determine without reference to another frame whether the frame includes a random noise portion in

addition to the normal video portion. When the frame does include random noise, each macroblock is evaluated and the encoding of the macroblocks within the random noise portion is adjusted to reduce the number of bits used by biasing the coding towards predictive coding. Claim 17 is illustrative of the claimed invention, and it reads as follows:

17. A method for encoding a frame of a sequence of frames, each frame having a plurality of macroblocks, said method comprising:

> using intraframe statistics to determine without reference to another frame whether said frame includes a random noise portion and a normal video portion; and
>
> when said frame includes said random noise portion and said normal video portion, evaluating each macroblock of said plurality of macroblocks in said frame and adjusting encoding of at least some macroblocks thereof within said random noise portion of said frame, said adjusting comprising reducing bits used in encoding said at least some macroblocks within said random noise portion by biasing coding thereof towards predictive coding.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Resnikoff et al. (Resnikoff)	5,148,498	Sep. 15, 1992
Uz et al. (Uz)	5,682,204	Oct. 28, 1997

Claims 1 through 5, 7, 9, 12, 13, 15 through 18, 20 through 26, 28, and 31 through 38 stand rejected under 35 U.S.C. § 103 as being unpatentable over Uz in view of Resnikoff.

Reference is made to the Examiner's Answer (Paper No. 22, mailed April 8, 2003) for the examiner's complete reasoning in support of the rejection, and to appellants' Brief (Paper No. 21, filed January 23, 2003) and Reply Brief (Paper No. 23, filed June 5, 2003) for appellants' arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will reverse the obviousness rejection of claims 1 through 5, 7, 9, 12, 13, 15 through 18, 20 through 26, 28, and 31 through 38.

Independent claim 17 recites determining, using intraframe statistics, whether a frame includes both a random noise portion and also a normal video portion. Claim 17 further recites if the frame does include both portions, evaluating each macroblock in the frame and biasing the coding of some macroblocks in the random noise portion towards predictive coding.

The examiner asserts (Answer, page 3) that Uz discloses in column 3, lines 25-27, "using intra-frame statistics to determine without reference to another frame whether said frame includes a random noise portion and a normal video portion." However, the

portion of Uz relied upon merely states that "[f]rame encoding is typically preferred when the video scene contains significant detail with limited motion," whereas "[f]ield encoding, in which the second field can be predicted from the first, works better when there is fast movement." The portion of Uz relied upon by the examiner says nothing about using intra-frame statistics to determine whether the frame includes a random noise portion and a normal video portion. Uz merely compares frame encoding with field encoding. The examiner asserts (Answer, page 8) that the three referenced lines of Uz disclose

> frame encoding is preferred when a video scene contains "significant detail" because that is where bits need to be conserved for encoding those video images, especially when the "normal video portion" has a lot of complexity. But, in order to determine the amount of bits for conservation during the intra-frame coding process, intra-frame statistics must be gathered in Uz for computing the number of bits that should be conserved for encoding a frame.

However, we find nothing in Uz that would support the examiner's assertion and suggest the claimed determination using intra-frame statistics of whether the frame has a random noise portion and a normal video portion.

Further, the examiner admits (Answer, page 5) that "Uz does not specifically disclose the limitation of 'determining whether said frame includes a noisy portion, and if so, then for each

macroblock of said frame'" and relies upon Resnikoff for a teaching of determining noise in frames. Specifically, the examiner contends (Answer, page 5) that Resnikoff transforms the image into four arrays of frequency coefficients with the LL set being "the lower frequency information that is more important to human viewing or the normal video portion." The examiner states that the other three sets of coefficients are the less important video information (or random noise portions) and that they "are allocated by zero bits, thus preserving more bits for the LL set element."

Appellants argue (Brief, page 10) that Uz, as acknowledged by the examiner, does not disclose determining whether a frame includes both a noisy and a normal video portion. Furthermore, appellants (Brief, pages 10-11) challenge the examiner's characterization of Resnikoff. Specifically, appellants indicate (Brief, page 11) that

> [a]s is well known to one skilled in the art, transformation of a pixel from the spatial domain to the frequency domain results in <u>both</u> low frequency coefficients and high frequency coefficients. Thus, pixels from a random noise portion of a frame would result in both low frequency and high frequency coefficients once undergoing linear transformation as taught by Resnikoff.

We note that the examiner (Answer, page 9) merely repeats the rejection and fails to respond to this argument.

As indicated ***supra***, we find nothing in Uz that would suggest the claimed step of using intraframe statistics to determine whether a frame includes a random noise portion and a normal video portion. Additionally, we agree with appellants that Resnikoff's frequency coefficient arrays do not equate to random noise and normal portions of the frame. Therefore, we agree with appellants that neither reference teaches or suggests the limitation at issue. Furthermore, since Uz discloses (column 8, line 24-column 9, line 32) that a total activity (IA_n) of ***each*** macroblock is calculated and an inter/intra decision is determined for ***each*** macroblock, it is unclear to us why a skilled artisan would modify Uz to determine first which frames have a random noise portion and then to determine macroblock activity only for the macroblocks in frames determined to include random noise.

Thus, for the reasons explained ***supra***, we cannot sustain the rejection of claim 17 nor its dependents, claims 18 and 20 through 23. In addition, since claim 31 includes a pre-encode processing unit for making the determination we found lacking from the references, and claim 38 includes computer readable program code means for causing a computer to make the same determination we found lacking from the references, we cannot

sustain the rejection of claims 31 and 38 nor of their dependents, claims 32 through 36.

Independent claim 1, like claim 17 recites using intraframe statistics to determine whether a frame includes a random noise portion and a normal video portion, but then specifies the particular steps for evaluating the individual macroblocks. However, since we have found ***supra*** that Uz and Resnikoff lack the initial determination step, we cannot sustain the rejection of claim 1 nor its dependents, claims 2 through 5, 7, 9, 12, 13, 15, and 16. Further, similar to claims 31 and 38, respectively, claim 24 recites structure (in the form of a means) for making the determination we found lacking from the references and claim 37 includes computer readable program code means for causing a computer to make the same determination we found lacking from the references. Therefore, we cannot sustain the rejection of claims 24, 37, and their dependents, claims 25, 26, and 28.

CONCLUSION

The decision of the examiner rejecting claims 1 through 5, 7, 9, 12, 13, 15 through 18, 20 through 26, 28, and 31 through 38 under 35 U.S.C. § 103 is reversed.

REVERSED

JERRY SMITH)
Administrative Patent Judge)
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ANITA PELLMAN GROSS) BOARD OF PATENT
Administrative Patent Judge) APPEALS
) AND
) INTERFERENCES
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HOWARD B. BLANKENSHIP)
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